OPERATING INSTRUCTIONS

FOR

MODEL 1200-E
Volt-Ohm-Milliammeter

STABRO LABORATORIES, INC.
TECHNICAL REFERENCE LIBRARY
DOCUMENT CONTROL ADMINISTRATOR

THE TRIPLETT ELECTRICAL INSTRUMENT Co.
MANUFACTURERS OF
PRECISION MEASURING INSTRUMENTS
BLUFFTON, OHIO

SAFETY NOTICE

EXTREME CARE MUST BE OBSERVED WHEN USING THIS INSTRUMENT IN CIRCUITS HAVING HIGH VOLTAGES WHICH ARE DANGEROUS TO LIFE. PERSONS NOT FAMILIAR WITH THE SERVICING OF HIGH VOLTAGE CIRCUITS SHOULD NEVER MAKE TESTS IN SUCH CIRCUITS.

MP MASTER
MA26142

The Triplett Electrical Instrument Co.
BLUFFTON, OHIO

OPERATING INSTRUCTIONS

FOR

MODEL 1200-E VOLT-OHM-MILLIAMMETER

The Model 1200-E Volt-Ohm-Milliammeter has been designed primarily for radio set testing. The unit consists of a Twin Instrument housing one D'Arsonval movement for the Direct Current measurements and one Iron Vane Repulsion movement for the Alternating Current measurements, mounted in a metal case which also holds the switches, resistors, batteries, etc.

The sensitivity of the D. C. movement is 40 Microamperes full scale and 25,000 ohms per volt on all the D. C. voltage ranges. The movement is calibrated to 200 Millivolts and therefore all the current ranges have a full scale value of 200 Millivolts at their rated current.

The A. C. movement has a sensitivity of 25 Milliamperes and 10 volts full scale, or 40 ohms per volt.

Two 1.5 volt batteries and one 22.5 volt "B" Battery supply the energy for the Ohmmeter circuits.

An extra jack having a .5 MFD condenser in series with it, is connected to the minus or common Volt-Ohm-Ma. jack. This condenser is used for Output measurements or to measure Alternating Current in circuits where Direct Current is also present. The condenser prevents the possibility of any Direct Current registering on the meter.

A 20-position selector switch is provided for selecting the proper voltage, current or resistance range. Three Ohmmeter Zero Adjusting rheostats are used which permit individual settings of the zero for the Ohmmeter scales thereby eliminating the need for readjustment when changing from one range to the next. Of course, as the battery voltage goes down, new adjustments will have to be made for each circuit. The zero adjuster marked 40M ohms is also used for the 0-1000 ohm shunt type circuit labeled LOW on the panel.

The following is a list of the ranges available on this Tester as well as instructions for reading the scales. The D. C. and resistance readings are taken on the left hand instrument. The A. C. Voltage readings are made on the right hand instrument.

A. C. VOLTS

Range	Read Scale	Multiply by	Value Per Division
0-10	0-10	1	.2 Volt
0-50	0-50	1	1.0 Volt
0-250	0-250	1	5.0 Volts
0-500	0-500	1	10.0 Volts
0-1000	0-10	100	20.0 Volts

	D. C. VOLTS		
0-10	0-10	1	.2 Volt
0-50	0-50	1	1.0 Volt
0-250	0-250	1	5.0 Volts
0-500	0-500	1	10.0 Volts
0-1000	0-10	100	20.0 Volts
	D. C. MILLIAMPERES		
0-1	0-10	.1	.02 Ma.
0-10	0-10	1.0	.2 Ma.
0-50	0-50	1.0	1.0 Ma.
0-250	0-250	1.0	5.0 Ma.
	D. C. MICROAMPS		
0-50	0-50	1	1 Mic. A.

	OHMS		
0-1000	Low	Direct	See Detailed Operation
0-40M	Ohms	Black Figures	See Detailed Operation
0-4 Meg.	Ohms	Black and Red Figures	See Detailed Operation
0-40 Meg.	Ohms	Black and Red Figures $\times$ 10	See Detailed Operation

GENERAL PRECAUTIONS

The following list of precautions should be observed for maximum satisfaction and service from this tester.

Be sure instrument pointers are on zero before taking any readings.

Always start with the highest range first when an unknown value of voltage or current is to be measured.

Do not leave the Ohmmeter switch on the LOW OHM position, as it will run down the battery.

Do not connect the instrument to a condenser which may be charged to an abnormally high voltage unless you use a sufficiently high voltage range.

For the utmost accuracy the instrument should be in a horizontal position. This will eliminate any unbalance errors which may enter in after the instrument pointer has been bumped against the stop by a temporary overload.

Do not drop the Tester, as the pivots and jewels or the element alignment may be injured.

Do not change the selector switch while the instrument is connected to a high voltage range as the resulting arc may burn out a portion of the switch requiring replacement of the entire unit.

The instrument is directly connected to the VOLT-OHM-MA. jacks while the Selector Switch is in the LOW OHM position. Serious trouble may occur if this or any of the Ohmmeter ranges are used for measurements while there is voltage or current in the circuit to be tested.

Do not take Ohmmeter readings on a circuit containing voltage or current as the Ohmmeter may be burned out and a correct reading cannot be obtained regardless.

D. C. CURRENT MEASUREMENTS

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black probe into the black jack.

Set the selector switch to a DC milliammeter range which you are sure is safely higher than the current to be measured. If in doubt, use the 250 MA range first.

Open the circuit in which current is to be measured, and connect the test leads to the resulting circuit leads, with the red test lead going to the positive lead (or terminal) of the circuit, and the black test lead going to the negative circuit lead. (For example, when measuring the plate current of a tube by disconnecting the plate supply wire from the plate terminal of the socket, the black test lead would go to the socket terminal, and the red test lead would go to the disconnected wire.) **Be sure that all power is off in the circuit while making these connections.**

Apply power while watching the meter, and be ready to disconnect one test lead immediately if the pointer swings off scale due to use of too low a current range. If the pointer moves backward, remove power while you reverse the test leads. If the pointer moves in the right direction but not far enough for an accurate reading, go to a lower current range. Cut off power while changing ranges, to prevent damage by arcing at the switch contacts or at the high-current jacks.

CAUTION: Do not connect current ranges across a voltage source (not even across a dry cell). A high percentage of meter burn-outs is due to neglect of this basic rule.

D. C. VOLTAGE MEASUREMENTS

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black probe into the black jack.

Set the selector switch to a DC voltage range which you are sure is safely higher than the voltage to be measured. If in doubt, use the 1000 V range first.

Connect the test leads to the terminals between which a DC voltage is to be measured, with the red test lead going to the positive terminal.

If the meter reads backward, reverse the test leads. If the meter pointer moves in the correct direction (up scale) but reading is too small

to be read with accuracy, temporarily disconnect one test lead while you change the selector switch to a lower range.

Read DC voltage values on the left meter. Refer to the table on pages 3 and 4 when in doubt as to which scale value to read. All DC voltage ranges have a sensitivity of 25,000 ohms per volt.

A. C. VOLTAGE MEASUREMENTS

Plug the short test probes into the two jacks marked V-O-MA, red in red and black in black. (Polarity does not matter in AC measurements, but probes inserted in this way will be correct for any DC measurements you may make later.)

Set the selector switch to a safely high AC voltage range, using the highest range first if in doubt.

Connect the test leads to the terminals being measured, without regard for polarity.

If the meter reading is too small to be read accurately, disconnect one test lead temporarily while you change the selector switch to a lower range.

Read AC voltage value on the right meter.

RESISTANCE MEASUREMENTS

Ohms—0-1000 (LOW), Shunt type.

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black probe into the black (negative) jack.

Turn selector switch to ohmmeter position marked LOW and with a screw driver rotate the 40 M OHMS ZERO ADJUSTER until meter pointer reads full scale. (This is the point marked 10-50-250-500 on the D. C. scale.)

Short the test probes together, the meter pointer should come back toward the position marked zero ohms on the center arc. This indicates there is no resistance connected between the test probes.

Select any value of resistance between zero and one thousand and connect it between test probes and note that the pointer will come down scale and indicate the corresponding value. The value per division varies between marked points;

0 to 20 ohms, 1 ohm per division;
20 to 40 ohms, 2 ohms per division;
40 to 100 ohms, 5 ohms per division;
100 to 200 ohms, 20 ohms per division;
200 to 400 ohms, 50 ohms per division;
400 to 1000 ohms, 500 ohms per division.

CAUTION: Never leave the switch resting on this position when the ohmmeter is not in use in order to conserve the battery.

Ohms—0-40,000, Series type.

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black probe into the black (negative) jack.

Turn selector switch to ohmmeter position marked 40 M. Short test probes together and with a screw driver rotate the 40 M OHMS ZERO ADJUSTER until meter pointer reads full scale. This is at a point marked 10-50-250-500 on the D. C. scale.

NOTE that this is the same adjuster that was used for the previous range and if setting hasn't been disturbed, no readjustment will be necessary.

Select any value of resistance between zero and 50,000 ohms and connect it between test probes, and note the pointer will go up scale and indicate the corresponding value. The value per division varies between marked points;

0 to 100 ohms, 10 ohms per division;
100 to 400 ohms, 20 ohms per division;
400 to 1000 ohms, 50 ohms per division;
1000 to 2000 ohms, 100 ohms per division;
2000 to 3000 ohms, 200 ohms per division;
3000 to 10,000 ohms, 1000 ohms per division;
10,000 to 40,000 ohms, 10,000 ohms per division.

Ohms—0-4 Megohms, series type.

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black into the black (negative) jack.

Turn selector switch to ohmmeter position marked 4 MEG. Short test probes together and with a screw driver rotate the 4 MEGOHMS ZERO ADJUSTER until meter pointer reads full scale. This is at a point marked 10-50-250-500 on the D. C. scale.

Select any value of resistance between zero and 4 megohms and connect it between the test probes. Read value indicated on the same arc as the 40,000 ohm range using black and red numbers. Markings per division are 100 times those listed for the 40,000 range.

Ohms—0-40 Megohms, series type.

Plug the short test probes into the two jacks marked V-O-MA, with the red probe going into the red (positive) jack and the black into the black (negative) jack.

Turn selector switch to ohmmeter position marked 40 Meg. Short test probes together and with a screw driver rotate the 40 MEGOHMS ZERO ADJUSTER until meter pointer reads full scale. This is at a point marked

10-50-250-500 on the D. C. scale.

Select any value of resistance between 0-40 megohms and connect it between the test probes. Read value indicated on same arc as 4 Meg. range. Use black and red numbers and multiply readings by ten.

OUTPUT MEASUREMENTS

The so-called OUTPUT MEASUREMENTS are used for measuring the AC or Voice Component at the Audio Stages where DC and AC are combined in the same circuit. The black lead should be switched to the OUTPUT Connection by bringing the lead from the Negative jack down to the lower jack. This then inserts a one-half Microfarad 400 Volt condenser in series with the meter and no DC can register on the instrument. The AC will be in error due to the drop in the condenser which can be taken into account or compensated for, if accurate values are required, the maximum point being the main indication and the condenser error can therefore be disregarded.

MISCELLANEOUS MEASUREMENTS

EXTERNAL SHUNTS for higher current ranges may be obtained for plugging into the jacks. These shunts are designed for use with the switch on the DC 10 Ma. position.

CONDENSERS may be checked for SHORTS or LEAKAGE RESISTANCE with the Ohmmeter ranges. DISCHARGE CONDENSER BEFORE MAKING TEST. The tests are made at 24 volts when using the 4 or 40 megohm range and 3 volts on the 1000 or 40,000 ranges.

CONDENSER CAPACITY or CONTINUITY tests are made by connecting the 250 AC VOLT range in series with the condenser and a source of 110 volt, 60 cycle Alternating Current. No Reading, indicates open condenser or very low capacity (below .05 MFD.). Upscale readings can be used to indicate capacity up to 1 MFD. by using the curves furnished in this booklet.

For CAPACITY tests between 1 and 10 MFDS., connect the 10 volt AC range in series with the condenser to be checked and a source of 5 volts, 60 cycle Alternating Current. By following the meter reading to right on CAPACITY CHART until it intercepts the curve, then dropping straight down to the lower edge, the capacity in Microfarads can be obtained. Example—Meter reads 4. Following this line on CAPACITY CHART towards the right until it intercepts the curve then following this point down to the base line, a capacity of 9 MFDS. is indicated.

Leakage or an increase in voltage or frequency will give higher readings and this table will not be accurate.

MAINTENANCE

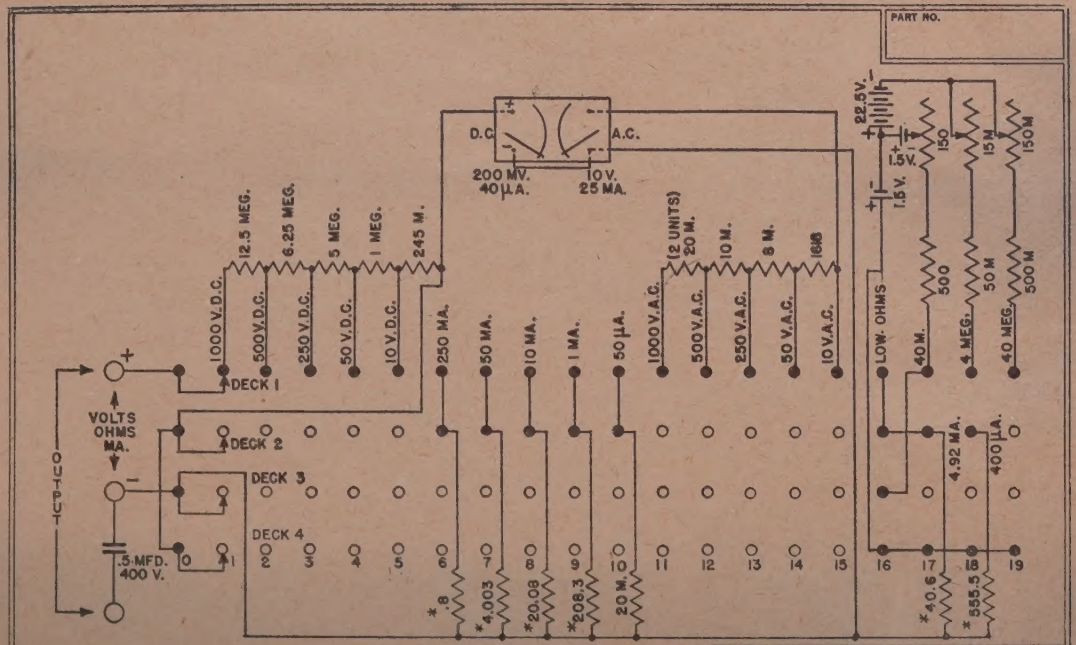
The Model 1200-E should be opened for replacement of the batteries. No other service work should be done on this instrument at any time, except by authorized repair shops or by the manufacturer.

REPLACEMENT OF BATTERIES

For replacement batteries one Burgess No. 4156 or Eveready No. 763 22.5 volt "B" Battery, as well as two No. 1 Eveready or No. 935 Burgess 1.5 flashlight cell, or their equivalent, should be used.

Batteries should be replaced when the Ohmmeter cannot be adjusted to zero with the proper rheostat. The negative of the "B" Battery connects to the White lead while the positive connects to the blue lead.

The 1.5 volt batteries are removed and replaced in the special holders.



*CALIBRATION RESISTOR, APPROXIMATE VALUE.

TRIPLETT ELECTRICAL INSTRUMENT CO.
BLUFFTON, OHIO, U. S. A.

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1200-E CIRCUIT DIAGRAM

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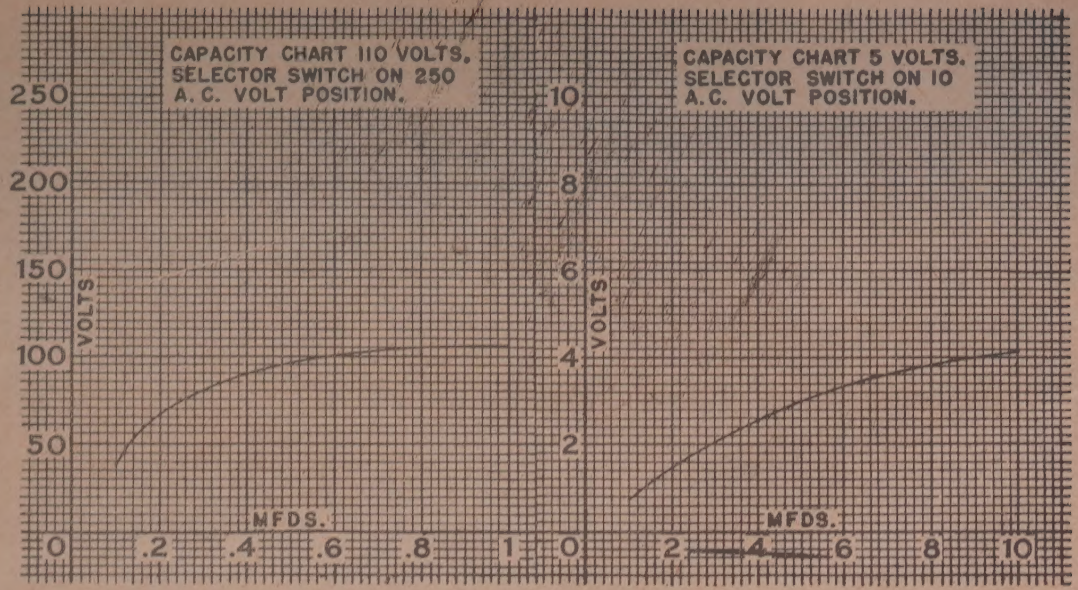
CAPACITY CHART 110 VOLTS.
SELECTOR SWITCH ON 250
A. C. VOLT POSITION.
250
200
150
100
50
0
VOLTS
MFDS.
.2
.4
.6
.8
1
CAPACITY CHART 5 VOLTS.
SELECTOR SWITCH ON 10
A. C. VOLT POSITION.
10
8
6
4
2
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VOLTS
MFDS.
2
4
6
8
10

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